arctica, and that accordingly the view suggested by Reiter that the mountains of South Victoria Land were the continuation of the mountain chain of New Zealand might require modification. The geological results issued in this volume show that, as expected, South Victoria Land is a high plateau broken off to the east by the subsidences which have formed the Ross Sea. Moreover, the suspected affinities between Victoria Land and New Zealand have been greatly strengthened by the discovery of the kenyte series of Ross Island; and the predictions in NATURE (vol. lxiii., p 610) that "the palæontological results may be meagre" has proved only too true. Reiter's theory, however, requires one modification. The earlier descriptions of Victoria Land asserted the volcanic nature of the mountains on the plateau of South Victoria Land (as, *e.g.*, is the case in Mexico and parts of the Andes), whereas the volcanoes, at least in the area reached by the expedition, were limited to the foundered area in front of the plateau, as is the case in eastern Asia. Accordingly the structure of South Victoria Land may be of the inner or secondary Pacific type, and any remains of an outer or primary Pacific coast connecting New Zealand and Graham Land may be expected further to the east. The evidence is not yet sufficient for a final opinion, and an alternative interpretation, in deference to the petrographic evidence, is to regard the coast of South Victoria Land as of the Atlantic type; but there does not seem any clear reason why the distribution of volcanic rocks of different chemical types should be controlled by the nature of the crustal movements. The suggestion that fold movements produce volcanic rocks of the Pacific type, and subsidences those of the Atlantic type, is no real explanation; and though the coincidence is certainly widespread, it does not appear to be universal. The chemical character of the volcanic rocks can only be used as a test of the tectonic structure of coasts with important limitations; and the coastal types may still be regarded as based essentially on geographical structure, and not on the chemical composition of their lavas.

J. W. GREGORY.

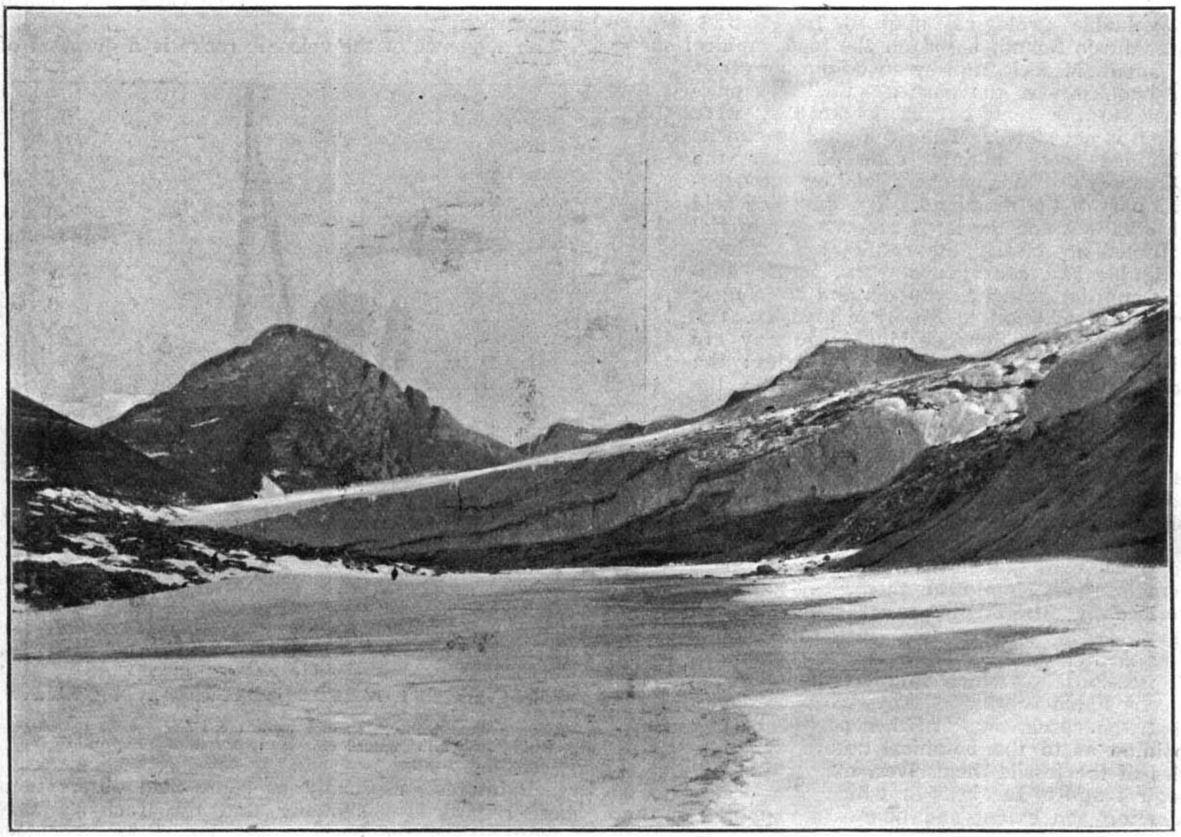

FIG. 2.—Uplift of morainic material in the ice at the foot of Knob Head. National Antarctic Expedition.

NAVIGATION OF THE AIR.[1]

THE author of this work at the outset states that he has no intention of writing a technical text-book, and his treatment of the subject, which embraces aërial navigation generally, is distinctly of a popular kind. Portions of the work, for example, those relating to ballooning and balloon photography, are dealt with in great detail, and show an intimate practical acquaintance with the subject; the section also relating to carrier pigeons, both in connection with ballooning and otherwise, is a welcome addition to the literature of the homing pigeon. On the other hand, some portions of the work are scarcely satisfactory, even from the popular standpoint, the chapter devoted to flying machines, for example, being a collection of scraps of information strung together without any definite scheme; on the face of it, this chapter is intended to be arranged in historical order, but

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[1] "Airships Past and Present, together with Chapters on the Use of Balloons in Connection with Meteorology, Photography, and the Carrier Pigeon." By A. Hildebrandt. Translated by W. H. Story. Pp. xvi+364. (London . A. Constable and Co., Ltd., 1908.) Price 10*s*. 6*d*. net.

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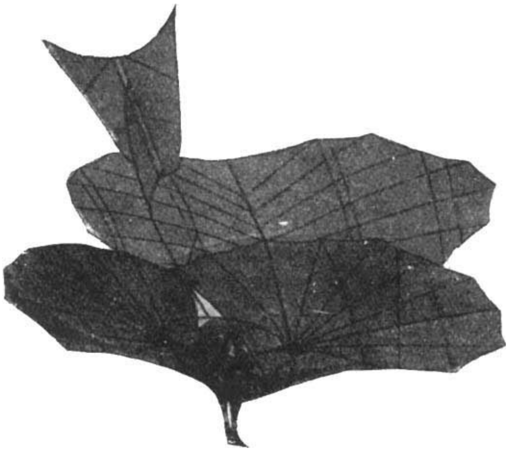
dates are not given where they are of importance, and even so well-known a worker in the field as Hargraves is practically ignored.

The illustrations are numerous, and, on the whole, are very good; of special interest is the photographic reproduction of a "double deck" Lilienthal machine in flight, which appears to be of the type used by the late Herr Lilienthal on the occasion of his last flight, when he unfortunately met with his fatal accident. Of the great variety of "birds' eye" photographs given, perhaps the most interesting are the cloud studies given in Figs. 125, 143, and 185; also a fine view of the pyramids of Egypt, Fig. 200.

The chapters on ballooning entitled "Ballooning as a Sport," "Scientific Ballooning," and "Balloon Photography," in addition to those on "Military Ballooning," make interesting reading, and constitute the most useful and trustworthy portion of the book; there is much information collected in pages devoted to these chapters that might be sought for elsewhere in vain. The account, however, is essentially of a popular kind; it is difficult to read these chapters without raising an "aëronautical appetite"; the description of over-sea ballooning and the illustrations of the de la Vaulx *deviator* are particularly interesting.



Lilienthal on his flying machine. From "Airships Past and Present."

It is when departing from the declared intention of the work that its author most lays himself open to criticism. Thus, on p. 17, in discussing the theory of the ascension of the *Montgolfiere,* there is a simple little pitfall into which the author has gratuitously precipitated himself. On the assumed barometric pressure of 30″ of mercury, it is stated (we may presume correctly) that the weight of a cubic foot of air heated to 212° F. is 0·059 lb. Herr Hildebrandt then goes on to say:—

"At a height of 8330 feet, a cubic foot of air at a temperature of 32 deg. Fahr. weighs only 0·059 lb., and therefore a 'Montgolfiere' cannot reach a greater height than this, seeing that the lift then disappears, unless the temperatures, given in the above table, can be exceeded."

The assumption made here seems to be that the air within the balloon does not expand as the pressure is relieved by altitude, just as if the air inside the balloon were contained by a hermetically sealed pressure-proof envelope.

On p. 30 a description is given of an aneroid barometer which certainly is a mistake; either the word *tube* has been used in translation instead of *diaphragm,* or else the author describes a particular aneroid (probably made by Bourdon, of Paris) instead of the aneroid as generally constructed; the almost universal practice of instrument makers is to employ a flexible diaphragm, not a tube as stated.

On p. 89 it is somewhat puzzling to find that most of the "dirigibles" have a greater content than that of their containing cylinder—according to the figures given. For example, a balloon 30 feet in diameter and 148 feet long is given as holding 137,500 cubic feet of gas; in view of the fact that a cylinder of these dimensions has a volume of only 105,000 cubic feet, this requires some explanation. Several other cases are equally incomprehensible.

On p. 96 the year 1862 is assigned to Phillips's "venetian blind" captive machine; this appears to be an error of about thirty years (antedate).

The fatal accident to Herr Lilienthal is stated to have been due to a want of adjustment, the machine turning over at a height of 50 feet from the ground. The authority for this version of the accident should be stated; the account, as published in Nature (September 3, 1896), contributed by Prof. Carl Runge, from the evidence of an eye-witness (the assistant of Herr Lilienthal), made no mention of any error of adjustment, but attributed the capsize to a sudden gust, which carried the machine to a height of 30 metres (100 feet), from which the fatal plunge took place.

In the chapter on carrier pigeons an account of certain experiments, stated to have been made with trained swallows, is given, but again no trustworthy authority is mentioned. A passage may be quoted as follows:—"An Antwerp trainer sent up some swallows and pigeons at the same time at Compiègne, in France. The pigeons covered the distance of 145 miles in 3¾ hours, while the swallows arrived in 1 hour 7 minutes; the speed of the latter was therefore three times that of the former." Now the time taken by the pigeons appears to denote that there was no wind of consequence, and therefore the velocity of flight of a swallow may be calculated as 130 miles per hour, a conclusion full of improbability. Statements of this kind should only be inserted in a serious work after careful verification, and with the authority stated, place and time also being given, if possible.

NOTES.

The fourth International Congress of Mathematicians was opened at Rome on Monday, April 6, in the presence of King Victor Emmanuel II., and the proceedings concluded on Saturday last, when an invitation was accepted to hold the congress of 1912 at Cambridge. The number of members shows a considerable increase on that of previous congresses, and a great deal of valuable work has been done in the sections. The Guccia medal has been awarded to Prof. Francesco Severi, for his papers on the geometry of algebraic surfaces. We hope to give an account of the proceedings of the congress next week.

It was announced at the meeting of the Institution of Naval Architects on April 8 that the council had gratefully accepted an offer from Mr. A. F. Yarrow, vice-president of the institution, to defray the cost, up to 20,000*l*., of an experimental tank for research purposes to be erected at the National Physical Laboratory, provided that cost of maintenance for the first ten years was assured. A committee is to be appointed to carry out the scheme. Papers on the employment of the steam turbine for various classes of ships took a prominent place in the proceedings of the meeting. Lord Cawdor was elected president of the institution upon the retirement of Lord Glasgow.

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